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ABSTRACT

This paper describes the development of technical word lists for elementary school children in the subject areas of art, composition, grammar, handwriting, literature, mathematics, music, physical education, reading, science, social science, and spelling. It summarizes how forms of entries were chosen, what the editing procedures were, and how the words were processed for computer. It describes the results including the number of words in each area, the overlap between subjects, and how discrepancies between reviewers in each subject area were handled. The appendixes include the textbook lists for each subject area, names and qualifications of the reviewers, the instructions for the reviewers, a listing sheet, an example of a textbook outline for the reviewers, a follow-up notice sent to each reviewer, instructions for editing, and record layout forms for input and output data. (TJ)

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COMPILATION OF THE TECHNICAL LEXICON

Mary Rhode

ABSTRACT

This report documents the procedures used to compile the technical lexicon, the third component of the communication skills lexicon. Textbook sources are listed, procedures described, and results discussed.

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COMPILATION OF THE TECHNICAL LEXICON

Mary Rhode

The first two components of the communication skills lexicon are the entry lexicon, which is the set of words known by children entering kindergarten, and the general lexicon, which consists of the words learned by children after entering kindergarten and before finishing sixth grade (Rhode & Cronnell, 1974). The technical lexicon, the third component, is here defined as that set of words peculiar to a particular discipline, and not commonly used outside that discipline without changes to generalized meanings. Children are exposed to technical vocabularies in school both visually and aurally. Textbooks provide the technical terms that children read; oral instruction provides the technical terms that children hear.

Background

Although there has been considerable research involving technical word lists since Pressey (1924), there are currently no suitable studies of elementary level technical lexica. Many studies have been concerned with vocabulary in one subject area; a few are somewhat more comprehensive. Cole (1940) has at least two limitations: (1) it is outdated, and (2) it emphasizes secondary school content.

Stauffer's study (1966) of Reading, Arithmetic, Health, and Science vocabulary is based on textbooks published between 1944 and 1954, and applies only to grade levels 1-3. Words in Reading materials (e.g., stories, plays, articles) provided so-called technical terms in Reading; these were removed from the other three subject areas. This

could result in the absence of the basic terms add, subtract, multiply, and divide (because of their generalized connotations) from a list of technical words in Arithmetic.[1]

Carroll, Davies, & Richman (1971), while clearly more current, covers grades 3-9 instead of the K-6 levels desired for the communication skills lexicon. Moreover, as pointed out by Cronnell & Rhode (1972) and by Manelis (1972), the sampling procedures used make this source of technical vocabulary inadequate.

An even more recent study of elementary vocabulary by Harris & Jacobson (1972) also has limitations. Although it reflects grade levels 1-6, it covers only Reading,[2] Grammar, Mathematics, Science, and Social Studies, thus excluding several subjects commonly taught in elementary schools, e.g., Spelling, Composition, Literature, Music, and Art. The decision of whether or not a word is technical was based on "the combined judgment of the two...authors" (p.31); and, like the Stauffer (1966) study, the Harris and Jacobson technical list excludes words found in current Reading series, an inclusion rule that eliminated such clearly technical terms as angle and atom). Thus the development of a technical lexicon that would be as complete and current as possible and that would reflect specifically K-6 level instruction was undertaken.

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[1] The word lists from this study have never been published.

[2] Both the Stauffer and the Harris & Jacobson studies considered the terms in all Reading text (i.e., stories, plays, poems, etc.) as technical. The current technical lexicon specifies only terms used in the instructional text, not in the Reading material itself.

Sources and Review Procedures

The subject areas investigated are those commonly covered in elementary schools: Art, Composition, Grammar, Handwriting, Literature, Mathematics, Music, Physical Education, Reading, Science, Social Science, and Spelling. After a pilot study of music was conducted (Cronnell & Rhode, 1972), it was determined that three textbook series and three reviewers for each subject would be used. The criteria for selection of textbook series were: (1) common use (particularly as a California state-adopted text), (2) recent publication,[3] and (3) recommendations by persons knowledgeable in the subject area. The textbook series reviewed for this lexicon are listed in Appendix A along with the grade level coverage of each. Some series include more than one book in a grade level (e.g., Reading) while others consist only of teachers' guides (e.g., Physical Education). No supplementary workbooks or duplicated work sheets were reviewed. In all, 236 books were read in the recording of technical terms.

School textbooks yielded technical lexicon at two levels: students' texts and teachers' guides. In students' materials, all instructional text addressed to the students was reviewed. In teachers' guides, only those technical terms that a teacher might use orally in providing instruction to the students were included; items of vocabulary used in providing background for the teacher were not included. Students' terms and teachers' terms are listed separately throughout the lexicon.

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[3]Selection of the textbooks was made in 1972.

Each reviewer examined all grade level textbooks in all three series in his subject area. Twenty-eight reviewers participated, with some reviewing more than one subject area (Appendix B). For academic subjects all reviewers held bachelor's or master's degrees in the subject area; for nonacademic subjects (e.g., areas in which degrees are not usually offered), reviewers held either the closest equivalent degree or a teaching credential (Appendix C).

Reviewers were provided with a set of instructions (Appendix D) and either a dictaphone or a supply of printed listing sheets (Appendix E). For each book, an outline (Appendix F) was provided specifying what sections should and should not be reviewed. A follow-up notice (Appendix G) was sent to all reviewers during the third week to clarify questions that had arisen. Dictaphone tapes were transcribed by secretaries onto the printed listing sheets.

Form of Entries

Reviewers included items in the lexicon in the following forms:

1. Single words. The criteria described in Rhode & Cronnell (1974) for treating inflected words as their base forms were applied (e.g., painted → paint, lullabies → lullaby). Exceptions to these criteria were the -ing and -ed forms included in the entry and general lexicons if they were: (1) separate main entries in dictionary authorities, or (2) appropriate in either of the frames "It/He is very _____" (cf. Francis 1958, pp. 268-270) or "What it/he needs is a (good)_____." In the technical lexicon, these exceptions were not made.

2. Phrases. The form of technical lexicon entries was not restricted to single words. The pilot study of music (Cronnell & Rhode, 1972) made clear the need to include some phrases. In music, terms like a capella, French horn, and program music are really phrasal compounds with semantically inseparable components. Other phrases, e.g., quotation marks, are used in textbooks at lower grade levels than their component parts, functioning as compounds only when first introduced. The difficulty in providing a clear-cut definition or framework for phrases left reviewers with the responsibility of making subjective judgments about their appropriateness.
3. Proper nouns. These are names of people and organizations, geographical names, titles of important works in Art, Music, etc., events, and other categories of proper nouns. (See Appendix H, p.31).
4. Abbreviations and acronyms. Many are listed and from all subject areas, e.g., N (for noun) in Grammar, and NATO in Social Science.
5. Suffixes. When taught as concepts, a limited number of suffixes, mostly inflectional, are included, sometimes as single entries and sometimes as parts of phrases (e.g., ing form in grammar).

Most of the terms excluded are those that belong to open sets. These consist of:

1. Arabic and Roman numerals. A few exceptions occur when numerals are parts of phrases (e.g., 90 degrees in Mathematics, and IV, which stands for a type of chord in Music).

2. Cardinal and ordinal number names. Only one small set has been included, i.e., place value terms (e.g., ones, tens, hundreds).
3. Fractions and fraction names. An exception to this exclusion is a limited set of the fraction names most frequently used by young children (e.g., fourths, halves).
4. Time words. Although not an unlimited set, it is much too large for inclusion (e.g., one-thirty, one-thirty-one, one-thirty-two, etc.).
5. Hyphenated descriptive modifiers with -ed or -ing endings. This is an extremely productive construction and such terms are not usually listed in dictionaries (e.g., ice-covered, coal-producing). If the hyphen was not thus verified, it was removed, leaving a phrase.
6. Color names. Since these seem to be technical only to Art, they were excluded from all other subject area lexicons.

Editing Procedures

Editing of the lists of terms was done by five people, with a complete subject area always edited by only one person; the instructions followed are given in Appendix H. The spelling and form of compounds, acronyms, and abbreviations were verified in reference sources. The two dictionaries employed as authorities in the entry and general lexicons were also used for the technical lexicon, i.e., *Webster's seventh new collegiate dictionary* (1967, hereafter referred to as *Webster's*) and *The American Heritage dictionary of the English language* (1969, the *AHD*). These two dictionaries proved to be inadequate as authorities for some subject areas, particularly for Science. When even the unabridged *Webster's third new international dictionary* (1961)

failed to list some items, it became necessary to refer to an encyclopedia, sometimes one specific to the discipline, to verify and make consistent the spelling terms.[4]

There is considerable disparity between textbooks and even between dictionaries in the spelling of individual words, compounds, and abbreviations: e.g., Mohammedan in *AHD*, Muhammadan in *Webster's*, Muhammedan and Mahometan in other dictionaries (Emery, 1973, p. 86); Venus's-flytrap in *AHD* and *Webster's*, but also Venus's flytrap, Venus' flytrap, and Venus flytrap in some textbooks; ABC's in *AHD* and *Webster's*, but also A-B-C's, A B C's, and ABCs in textbooks. Only one form was listed in the lexicon. To provide consistency for processing, all punctuation which was not indicated in dictionary listings was deleted, but symbols denoting the types of deletions were added in a punctuation field. Since computer-processed language forms are represented only in upper-case letters, symbols indicating the capitalization were also included in the punctuation field. The last type of coding in this field was to indicate categories of proper nouns.

In addition to punctuation deletion and coding, terms listed by reviewers were converted to the allowable forms specified earlier (pp. 5 & 6). Inflectional suffixes were removed from one word entries, leaving only the base forms. Often the inflected form was the only one specified and the base form does not seem like a technical term in the

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[4]The following references were also consulted: *Grove's dictionary of music and musicians* (Blom, 1968), *Encyclopaedia Britannica* (1970), *Harvard dictionary of music* (Apel, 1962), *McGraw-Hill encyclopedia of science and technology* (1971), and *The Oxford companion to art* (Osborne, 1970).

subject area in which it is listed (e.g., crowd and miss in Handwriting, from crowded (letters) and missing (letter)).

There was an exception to this editing procedure. Technical vocabulary contains many inflected verb forms prefixed with un-. Removal of their inflectional suffixes would leave unacceptable words (e.g., unaccented but not unaccent; uncolored but not uncolor). Therefore, suffixes were not removed from prefixed participial verb forms unless an acceptable word remained. Many other productive prefixes also behave "more like compound elements. . . especially if they are 'strong' prefixes" (Quirk et al., 1972). Following a prefix entry, e.g., de-, the *AHD* usually states that "Many compounds other than those entered here may be formed with de-," and continues with instructions about hyphenating. Since these are such productive and open-end sets (certainly similar to compounds) and occur frequently in technical vocabulary, they were not excluded, even when they were not specifically listed in the dictionary.

Inflectional suffixes were removed from the components of a phrase when possible. However, modifiers in phrases were often inflected (e.g., dotted line in Handwriting) and could not be changed to base forms and still make sense. Plural inflections were generally removed, but in a few cases, these changes too, proved impossible (e.g., intersection of sets and twin primes in Mathematics). Exact duplications (i.e., same term, punctuation, text (students' or teachers'), subject area, series, grade level, and reviewer) were deleted when they were noticed, though no major effort was made to catch all of them in

editing. Misspellings were corrected, and printing was made legible. The letter codes previously assigned to each series (i.e., A, B, or C, as indicated in Appendix A) and the number assigned to each reviewer (i.e., 1, 2, or 3, as indicated in Appendix B) were entered in the appropriate columns (fields).

Although every effort was made by all editors to be thorough, accurate, and consistent, the lexicon will not be free of error. Editors were unable to proof against any copy and had to recognize errors on sight.

Computer Processing

After editing, the set of data was ready for computer processing.[5] Each term with its accompanying information was keypunched and verified (Appendix I), and cards were stored by subject area. A computer program, the Range Test, was developed to locate illegal characters in fields 5, 7, 9, 11, and 13. After a trial run in the rather small data set of Literature, it was decided that the relatively few errors in the information fields could be located and corrected more economically along with corrections of the technical terms. After all cards in a subject area had been keypunched and verified, they were sorted alphabetically and numerically, exact duplications were deleted, and a listing

[5] Early in the project, before reviews were begun on other subject areas, Spelling was used as a trial test. A computer program was developed for the deletion of duplications and all the information in the data base was condensed into an economical format. The reviewing and editing procedures and the computer programs that were applied to Spelling proved satisfactory and were used throughout the lexicon. Other computer programs necessary to generate the lexicon are documented in Tsai (1974).

was printed. This listing was then read and marked for correction of keypunching errors as well as for errors not caught in the original editing of unalphabetized data. Incorrect entries were keypunched and verified using the Update Program. The output was a clean data set stored on disc, ready for the Report Generating Program, and available for future use.

The format for the final report in each subject area is shown in Figure 1 (see Appendix J for output of data). Only one listing is provided for a term found in student text, or for a term from teacher text, with information from each series (i.e., A, B, or C) on separate lines. Every grade level (i.e., 0 (kindergarten)...6) at which a term was found by any reviewer and in any series is listed in reviewer columns (i.e., R1, R2, or R3). This provides an indication of terms that are technical only at lower grade levels, and are not specified in middle and upper grades (e.g., round, only at Grade 1 in Science). Also, it accounts for concepts that are taught in only one or two grade levels and are not repeated again (e.g., tide, only at grade 4 in Social Science). Averages are provided in addition ot the above information. The lowest grade levels found by reviewers in a series are averaged, rounding .5 down, to obtain the series average (SA). All of the series averages for a term are averaged to obtain the total average (TA), i.e., the average of the levels at which the three series introduced the term. This is not indicative of an average grade at which it is found.

Results

The total number of terms found in student as well as teacher text in the twelve subject areas is 36,981 (Table 1). This figure does not represent total unique terms, for there is some overlap of technical

	PUNCT	LX	TS	SA	S	GL(B1)	GL(B2)	GL(B3)	S-A	T-A
SYLLABICATION		T	T	CO	B	6	6		6	6
SYLLABLE		T	S	CO	A	6	56	56	5	5
					B	56	456	56	5	
					C	56	56		5	
SYLLABIE		T	T	CO	A	4		4	4	4
					B	256	2456	2456	2	
					C		5		5	
SYMBOL		T	S	CO	A	5	45	456	4	4
					B		456	56	4	
SYMBOL		T	T	CO	A	45	456	6	5	4
					B	45	345		3	
SYMBOLIZE		T	S	CO	A	5	45	4	4	4
SYMBOLIZE		T	T	CO	B		4		4	4
SYNONYM		T	S	CO	A	456	456	456	4	5
					B	6	6	6	6	
					C	5	5		5	
SYNONYM		T	T	CO	A	4	46		4	4
					B	1256	56	6	4	
					C	356	3456	3456	3	
SYNONYMOUS		T	S	CO	C	56	56	56	5	5
SYNONYMOUS		T	T	CO	A		45	45	4	4
					C	456	456	456	4	
SYNTAT		T	T	CO	B	4			4	4

FIGURE 1

EXAMPLE OF FINAL REPORT ON TECHNICAL LEXICON

TABLE 1

PERCENTAGES OF TOTAL TERMS

Subject Areas	S	T	S&T	S only	T only	Unique Terms	Total No. of Terms
Science	44	56	36	8	20	64	7367
Social Science	53	47	32	20	15	68	5163
Music	44	56	29	15	27	71	4697
Art	45	55	33	13	22	67	4066
Grammar	42	58	26	15	32	74	4064
Reading	27	73	21	5	52	79	2638
Composition	46	54	36	10	17	64	2352
Mathematics	47	53	38	9	15	62	1749
Literature	24	76	16	7	60	84	1416
Handwriting	45	55	33	12	22	67	1325
Phys. Educ.	--	100	--	--	100	100	1162
Spelling	44	56	33	11	23	67	982
							36,981

PERCENTAGES OF TOTAL UNIQUE TERMS

Subject Areas		S&T	S only	T only	Total No. of Unique Terms
Science		56	12	31	4078
Social Science		48	30	22	3491
Music		40	21	38	3349
Grammar		36	21	44	2993
Art		48	19	33	2741
Reading		27	7	66	2073
Composition		57	16	27	1496
Literature		20	9	72	1184
Phys. Educ.		--	--	100	1162
Mathematics		61	15	24	1086
Handwriting		50	18	32	886
Spelling		49	17	34	658
					25,827

Note: S = terms in student text; T = terms in teacher text;
S&T = terms found in both student and teacher text;
S only = S minus (S&T); T only = T minus (S&T);
Unique = (S&T) + (T only)

terminology across related subject areas. The lists were not combined and are twelve separate lexicons. The most notable area of overlap is found among the language arts subjects, i.e., Composition, Grammar, Handwriting, Literature, Reading, and Spelling (e.g., sentence and verb in all six subject areas). Mathematics and Science also have some terms in common (e.g., angle and axis). The fine arts subjects, Art, Literature, and Music are concerned with some of the same concepts (e.g., rhythm and tone), with Literature overlapping both language arts and fine arts subjects. Shared terms are not necessarily introduced at the same grade levels.

The largest lexicon is Science with 7,367 terms; the smallest lexicon is Spelling with 982 terms. In most subjects, approximately 45% of the terms were taken from student text and 55% from teacher text. Exceptions to this pattern were Literature and Reading with only about 25% of the terms from student text and 75% from teacher text. Very little instructional text for students is included in books in these subject areas. (Physical Education has only teacher text.) An unexpected reversal of the ratio was found in Social Science where 53% are student terms and 47% teacher terms. This could be a reflection of Social Science as an essentially informative subject in which there is much instructional text for students to read, and no specific skill that must be taught or directed by the teacher. In Composition and Mathematics there are high percentages of terms common to both student and teacher text. But there is an unexpectedly low percentage of such shared terms in Grammar.

Many factors contributed to these results. Individual differences in the reviewers and the degree of objectivity or subjectivity they brought to the task affected the numbers and types of terms listed.

Futher, the characters of the subject areas and their terminologies affected the reviewing. The nature of Mathematics resulted in a relatively small number of technical terms. On the other hand, Science, which really touches on many scientific fields in elementary instruction (e.g., Astronomy, Biology, Geology, Meteorology, etc.) has the largest number of terms, a high percentage of which are specified at only one or two grade levels. Some highly technical terms are used to teach a concept and never used again. Harris & Jacobson (p. 36) state that "in content textbooks, a particular word may be important for one topic, but when the treatment of the topic is over, there may be no further occasion for using the word in that book."

There are also some differences between the series in labels and terminologies used for the same concept. This is especially true in Grammar, which has one of the highest percentages of unique terms (e.g., question marker in series A, but question mark in series B and C). Such idiosyncracies expand the total of unique terms without increasing the technical concepts taught.

The forms of the terms themselves may have affected the reviewing. If a subject area contains many derived forms of a single base (e.g., drama, dramatic, dramatically, dramatics, and dramatize in Literature), a reviewer might overlook dramatization, for instance, because he would remember having written similar forms and misjudge it as a duplication.

Additionally, reviewing one grade level and then another made it difficult to remember whether a term had been recorded for the current grade level being reviewed or the lower one just completed. Inconsistencies between reviewers in specification of terms resulted.

Another factor causing inconsistencies is that people who specialize in a particular field tend to assimilate the technical vocabulary into their general vocabulary. They have difficulty recognizing the terms that would necessarily be technical at the elementary level. In general, it was felt that if one or two reviewers missed a term, the third would probably catch it. Also, there was a tendency to list a greater number of nouns and noun phrases than verbs or modifiers. This could signify either that most technical terms are nouns or that technical terms in other form classes were missed.

The above conditions resulted in inconsistencies among reviewers and lack of agreement between series. A notable exception is Composition, characterized by much reviewer and series agreement. Another interesting consistency is that terms specified from both S and T text were generally introduced at least one grade lower in T text than in S text.

Finally, the following word of caution should be observed concerning use of the technical lexicon as specified here. The lexicon represents an attempt to provide general inventories of the language in common use in various subject areas; it does not represent all of the basic concepts employed. There are many concepts involving relations or principles which may not have explicit names, and thus will not be represented. The lexicon describes observed word use; it does not prescribe instructional vocabulary or curricula content.

APPENDIX A

TEXTBOOK LIST

Subject	Ser.code	Series
1. ART		
	A	Hubbard, G. & Rouse, M. J. *Art: meaning, method and media.* Westchester, Ill.: Benefic Press, 1972. Grade levels 1-6.
	B	Jefferson, B. et al. *My world of art.* Boston: Allyn & Bacon, Inc., 1963-1964. Grade levels 1-6.
	C	Fearing, Kelly et al. *Our expanding vision-art.* Austin, Tex.: W. S. Benson & Co., 1960. Grade levels 1-6.
2. COMPOSITION		
	A	Fillmer, H. T. et al. *Composition through literature.* New York: American Book Co., 1967. Grade levels 4-6.
	B	Kirby, A., Grimm, M. & Loy, A. *Elementary school English.* Reading, Mass.: Addison-Wesley Publishing Co., 1967-1968. Grade levels 1-6.
	C	Treanor, J. H. *Oral and written composition.* New York: Macmillan Co., 1968. Grade levels 3-6.
3. GRAMMAR		
	A	Conlin, D. et al. *Our language today series.* New York: American Book Co., 1971. Grade levels 1-6.

Note: If all books in a series were not published in the same year, both the earliest and latest years are given.

Subject	Ser.code	Series
GRAMMAR (Continued)	B	Maxwell, J. C. et al. *Ginn elementary English series.* Boston: Ginn & Co., 1967. Grade levels 1-6.
	C	Roberts, P. *The Roberts English series.* New York: Harcourt Brace Jovanovich, Inc., 1968-1970. Grade levels 1-6.
4. HANDWRITING		
	A	Connelly, A. L. & Barrington, M. *Handwriting for daily use series.* Austin: W. S. Benson & Co., 1967. Grade levels 1-6.
	B	Peterson Handwriting. *Adventures in handwriting.* New York: Macmillan Co., 1971. Grade levels 1-6.
	C	Bell, M., Davidson, E., & Veal, R. *The new I learn to write series.* Indianapolis: Bobbs-Merrill Co., Inc., 1968. Grade levels K-6.
5. LITERATURE		
	A	Early, Margaret et al. *The bookmark reading program.* New York: Harcourt Brace Jovanovich, Inc., 1970-1971. Grade levels K-6.
	B	Johnson, E., Jacobs, L. B. & Turner, J. *Treasury of literature readers.* Banner Ed. Columbus: Merrill Books, Inc., 1966. Grade levels 1-6.
	C	Witty, P., Bebell, M., & Freeland, A. *Reading caravan.* Boston: D. C. Heath & Co., 1968. Grade levels 1-6.
6. MATHEMATICS		
	A	Duncan, E. R. et al. *Modern school mathematics, structure and use.* Boston: Houghton Mifflin Co., 1972. Grade levels K-6.

Subject	Ser.code	Series
MATHEMATICS (Continued)	B	Eicholz, R., O'Daffer, P., & Fleenor, C. *Investigating school mathematics.* Reading, Mass.: Addison-Wesley Publishing Co., 1972. Grade levels 1-6.
	C	Scott, L. F. et al. *Ginn elementary mathematics.* Boston: Ginn & Co., 1972. Grade levels 1-6.
7. MUSIC		
	A	Boardman, E. & Landis, B. *Exploring music.* New York: Holt, Rinehart & Winston, 1966. Grade levels K-6.
	B	Choate, R. A. et al. *New dimensions in music series.* New York: American Book Co., 1970. Grade levels K-6.
	C	Landeck, B., Crook, E., & Youngberg, H. C. *Making music your own.* Morristown, New Jersey: Silver Burdett Co., 1971. Grade levels K-6.
8. PHYSICAL EDUCATION*		
	A	Ewing, Neil. *Games, stunts, & exercises: a physical education handbook for elementary school teachers.* Palo Alto: Fearon Publishers, 1964.
	B	Irwin, Leslie W. *The curriculum in health and physical education.* Dubuque, Iowa: Wm. C. Brown Co., 1960.
	C	*Physical education, a curriculum guide.* Las Vegas, Nev.: Department of Instructional Services, Clark County School District, 1971.

*Each teacher's book covered grades 1-6.

Subject	Ser.code	Series
PHYSICAL EDUCATION (Continued)	D	Physical Educ. Framework Committee. *Physical education framework for California public schools.* Sacramento: California State Department of Education, 1969.

9. READING

A Harris, A. J. & Clark, Mae Knight, sr. authors. *The Macmillan reading program.* New York: The Macmillan Co., 1970. Grade levels K-6.

B Johnson, M. S. et al. *The read series.* New York: American Book Co., 1971. Grade levels K-6.

C VanRoekel, B., O'Donnell, M., & Evertts, E. *The Harper & Row basic reading program,* Strand 1. New York: Harper & Row, Publishers, Inc., 1966. Grade levels 1-6.

10. SCIENCE

A Jacobson, W. J. et al. *Investigating in science.* New York: American Book Co., 1972. Grade levels 1-6.

B Brandwein, P. F. et al. *Concepts in science.* New York: Harcourt Brace Jovanovich, Inc., 1966. Grade levels K-6.

C Rockcastle, V., Salamon, F., & Schmidt, V. *Elementary school science.* Reading, Mass.: Addison-Wesley Publishing Co., 1972. Grade levels K-6.

11. SOCIAL SCIENCE

A Brandwein, P. F. et al. *The social sciences: concepts and values.* New York: Harcourt Brace Jovanovich, Inc., 1970. Grade levels K-6.

Subject	Ser.code	Series
SOCIAL SCIENCE (Continued)	B	Hanna, P. R. et al. *Investigating man's world series.* Glenview, Ill.: Scott, Foresman & Co., 1970. Grade levels 1-6.
	C	King, F. M. et al. *Concepts in social science.* River Forest, Ill.: Laidlaw Bros., 1972. Grade levels 1-6.
12. SPELLING		
	A	Glim, T. & Manchester, F. *Basic spelling keys.* Philadelphia: J. B. Lippincott Co., 1967. Grade levels 1-6.
	B	Hanna, P., Hanna, J., & Hodges, R. *Power to spell.* Boston: Houghton Mifflin Co., 1967. Grade levels 1-6.
	C	Kottmeyer, W. & Claus, A. *Basic goals in spelling.* Manchester, Mo.: McGraw-Hill Book Co., 1972. Grade levels 1-6.

APPENDIX B

REVIEWERS

SUBJECT	REV.#	REVIEWER
ART		
	1	Rosemary Allen
	2	Christine Duffey
	3	Pamela Wilkes
COMPOSITION		
	1	Caroline Fieker
	2	Mary Rhode
	3	Virginia Supple
GRAMMAR		
	1	Susan Becher
	2	Laila Fiege-Kollmann
	3	Lee Trithart
HANDWRITING		
	1	Ann Humes
	2	Judy Mitchell
	3	Mary Rhode
LITERATURE		
	1	Lynn Corno
	2	Linda Lester
	3	Jane Oleyar
MATHEMATICS		
	1	Michael Bohlen
	2	Pat Lang
	3	Howard Wolfe
MUSIC		
	1	Rosemarie Cook
	2	Katy Merrill
	3	Ruth Zwissler
PHYSICAL EDUCATION		
	1	Anne Humes
	2	Judy Mitchell
	3	Mary Rhode
READING		
	1	Anne Humes
	2	Judy Mitchell
	3	Mary Rhode
SCIENCE		
	1	Elijah Babikian
	2&3	Two outside graduate science majors
SOCIAL SCIENCE		
	1	Jennifer Acosta
	2	Dorothy Boynton
	3	Jackie Maeder
SPELLING		
	1	Susan Becher
	2	Donna Kligman
	3	Paula Russell

APPENDIX C

QUALIFICATIONS FOR TECHNICAL LEXICON REVIEWERS

1.	ART	Bachelor's degree or Master's degree in Art or Art Education
2.	COMPOSITION	Bachelor's degree or Master's degree in English
3.	GRAMMAR	Bachelor's degree or Master's degree in English or Linguistics
4.	HANDWRITING	Teaching credential
5.	LITERATURE	Bachelor's degree or Master's degree in English
6.	MATHEMATICS	Bachelor's degree or Master's degree in Mathematics
7.	MUSIC	Bachelor's degree or Master's degree in Music or Music Education
8.	PHYSICAL EDUCATION	Teaching credential
9.	READING	Teaching credential
10.	SCIENCE	Bachelor's degree or Master's degree in Biology, Geology, or Physics
11.	SOCIAL SCIENCE	Bachelor's degree or Master's degree in History, Geography, or Social Science
12.	SPELLING	Bachelor's degree or Master's degree in Linguistics

APPENDIX D

INSTRUCTIONS FOR TEXTBOOK REVIEWERS

A. List, as technical, items that:

1. Are commonly used in the subject area (e.g., noun in Grammar)

2. Will not be understood by K-6 children without instruction, because they are either:

   a. New words (e.g., syllable in Spelling)

   b. Old words with new meanings (e.g., arrangement in Music)

3. Have different meanings in each of two or more subject areas (e.g., union in Mathematics, as well as union in Social Science)

B. Include these forms:

1. Single, uncapitalized words

2. Proper names, both single words and phrases

3. Abbreviations (e.g., U.S.) and acronyms (e.g., SWRL)

4. Phrases specific to the content area

   a. Those with special meanings that cannot be derived from the meanings of the separate components (e.g., French horn)

   b. Those that are compounds representing a single unit or idea (e.g., question mark, proper name, part of speech, two-letter vowel, indirect quotation)

   c. Be alert to the separate use of components of a phrase, including them as single entries (e.g., short vowel, vowel sound, but also, perhaps, vowel and sound; capital letter, but also, perhaps, letter and capital; common noun, but also, perhaps, noun; third person singular, but also, perhaps, singular and even third person).

d. Especially at early grade levels, the phrase may be taught before the separate words (e.g., quotation mark as a symbol, before the specific meaning of quotation). Therefore, watch for the introduction of the separate word at a higher level.

C. Follow these helpful hints:

1. Include words which you recognize as being necessary in an introductory book on the subject.

2. In making judgments, use you first impression.

3. Repeat items found at earlier grade levels.

4. It is not necessary to list a term more than once per grade level for each series, if you are sure it is a repetition.

5. Do not hesitate to repeat a term if you have any doubt that it was listed before.

D. Use these mechanics:

1. Before beginning each page, fill in the information at the top: series (the red letter, A, B, or C, given on the outline attached to each book), grade (underlined in red on the same outline), and your name.

2. Print everything in capital letters.

3. Indicate letters which were capitalized in the text by underlining each letter twice (e.g., NATO and United States).

4. Indicate hyphens, apostrophes, and periods (after abbreviations) clearly (e.g., Anglo-Saxon, ABC's, Calif.)

5. For each term, indicate whether it was found in text for teachers or students by inserting a T or S in the TS column (identified by heavy black lines).

6. Start each grade level on a new page.

APPENDIX E

LISTING SHEET

Serie ___ Grade ___ Reviewer _____

Technical Term	Punct	LX	TS	SA	S	G	R

APPENDIX F

EXAMPLE OF TEXTBOOK OUTLINE FOR REVIEWERS

Brandwein, Paul F.
The Social Sciences: Concepts and Values

Grade 1: Level 1 (Blue)
Grade 2: Level 2 (Red)

A. Students' pages

1. Review:

a. Titles, headings, labels, charts, maps (S)
b. All student text (S)
c. Include all of "Word List" at back of book (S)

2. Do not review:

a. "Concept" and "Setting" at top of each page

B. Teacher's guide

1. Review:

a. In each lesson, "Creating the Learning Situation", "Alternative Experiences for a Variety of Interests" (if included), and "Related Experiences" (if included) (T)
b. Include all "Key Concept Words" (T)

2. Do not review:

a. "Part One" (pp. T-9 to T-58)
b. "Introduction" to each unit
c. In each lesson, "Teaching Objectives"
d. Songs, poems, stories

APPENDIX G

FOLLOW-UP NOTICE SENT TO REVIEWERS

We are pleased with the progress that is taking place in the reviewing of textbooks for the technical lexicon. However, we would like to reemphasize a few points.

1. In each subject area, three different series will be reviewed for technical terms employed in instruction in that area. You are one of three reviewers who will all edit the same book.

2. Technical items are defined as those that are commonly taught in a discipline, but are not otherwise in general use by children in grades K-6; they may either be specific to the discipline, or have a special meaning in addition to a general meaning.

3. In teachers' manuals, all material will be examined, but only those technical items that a teacher might use orally in providing instruction to the students will be included; those items of vocabulary used in providing background for the teacher will not be included.

4. While the inclusion of phrases is important, they should be meaningful units which can be used outside of the context of the sentences in which they are employed. The suggestions under B.4 in "Instructions for Textbook Reviewers" should be helpful in deciding whether to include a phrase.

5. The outlines on the cover of each book have been designed to limit reviewing of unnecessary materials and should be carefully followed.

6. The reviews should move quickly. Our experience indicates that a great deal of skimming is possible. If a term is missed on one page, it will be picked up on another, or by another reviewer. The estimated time requirements (based on pilor work and on educated guesses) is for all three series. While these times can only be approximate, they appear to be reasonable for skimming, rather than detailed reading.

APPENDIX H

INSTRUCTIONS FOR EDITING THE TECHNICAL LEXICON

A. Edit technical terms by either reading handwritten lists or by listening to dictaphone tapes while proofing typewritten lists. These instructions apply to both types of editing. Do all marking with red pen or pencil, and use the following proofreaders' marks:

- delete (e.g., accent/mark)
- close up (e.g., hand writing)
- delete and close up (e.g., U/S/A.)
- insert space (e.g., fairy/story)

Unless otherwise noted, a delete mark on a hyphen or period will be key-punched as a space (e.g., accent/mark → accent mark and N/V/N. → N V N; but U/S/A. → USA).

B. First, fill in the following columns on the first line of each page.

Series A Grade 5 Reviewer (Name)

Technical Term	Punct	LX	TS	SA	S	G
TERRARIUM		T	S	SC	B	4

1. Label all "LX" columns with a "T" (for technical lexicon).
2. "TS" columns will already be labeled either "S" (for student term), or "T" (for teacher term), or both, by the reviewer.
3. Label "SA" columns with the first two letters of the appropriate subject (e.g., "SC" for science). Look for reviewer's name on attached list to determine subject area.
4. Label "S" (series) and "G" (grade) columns according to information in top right corner of each sheet, as indicated above.

5. Label "R" (reviewer) columns with the number assigned to that reviewer in that subject.

C. Second, check each term listed in the "Technical Term" column.

1. Correct misspellings.

2. Verify all compounds and possible compounds, acronyms, and abbreviations in either *The American Heritage dictionary of the English language or Webster's seventh new collegiate dictionary.*

a. If the term has more than one dictionary entry, with alternative orthographic forms, opt for the fused one-word spelling as first choice, the hyphenated form as second choice, and the two (or more) -word phrase as last choice (e.g., freeform instead of free form, boldface instead of bold-face, and finger-paint instead of finger paint.

b. If the dictionary entry includes a cross-referenced entry also in boldface, apply the same preferential order as above.

3. Remove the following inflectional endings from all single words except those indicated in #4, leaving only the base form, and correcting the spelling as necessary (e.g., lullabies). Note that forms other than verbs can be suffixed with -ed and/or -ing, and should be reduced to base forms.

plural -(e)s
possessive -'s
3rd person singular -(e)s
past tense or past participle -ed
present participle -ing
adjective degree forms -er and -est

4. Observe these exceptions to the above and do not remove inflections.

a. The plural form is semantically different from the singular (e.g., directions, table of contents). When in doubt, check the base form in *AHD*. If plural is different, there will usually be a numbered definition introduced by the italicized phrase, "Usually plural."

b. The word is a plural for which there is no singular form (e.g., physics, scissors).

c. The form without an -s suffix is not a noun (e.g., linguistics, not the adjective linguistic, and rapids, not the the adjective rapid).

d. There is no unsuffixed form (e.g., outstanding and rugged).

e. The word is an -ing form that is the name of a subject area represented in this lexicon (i.e., writing or handwriting, reading, and spelling).

f. The inflected word is part of a phrase which would be destroyed grammatically and/or semantically by the deletion (e.g., ing ending, beginning letter, checked vowel, and pair of sounds).

g. If the form is irregular in English, include both the irregular and base forms (e.g., congressmen and congressman).

5. Delete exact duplications when you notice them but be certain they are duplications in the same series, at the same grade level, and by the same reviewer. Do not attempt to catch all of them.

D. Third, code the following under the heading "PUNCT".

1. On the left-hand side of the column, code capitals first, immediately followed by symobls for deleted punctuation.

a. Code capital letters with the following symbols.

B - beginning letter capitalized (e.g., Asia and Bunsen burner)

I - initial letter of each word of a phrase capitalized (e.g., Great Britain and N V N)

W - whole term (one or more words) capitalized (e.g., CIO and VC CV

X - irregular distribution of capitals (e.g., ABCs and ABC order).

b. Code punctuation symbols deleted either because of dictionary-verified spelling change or to provide greater consistency in the recording of terms. When more than one symbol is to be coded for the same term, indicate the symbols in the sequence below (e.g., HUP, or HQ).

H - hyphens (delete unless term is hyphenated in dictionary)

Q - quotation marks (delete all)

U - underlining (delete all)

P - period (delete all)

2. On the right-hand side of the column, code the following (see example below):

A - abbreviation or acronym (e.g., USA)

C - celebration (e.g., Independence Day)

E - event (e.g., Constitutional Convention)

F - nonliterary fictional character (e.g., Uncle Sam)

G - geographical name (e.g., Paris)

L - literary character (e.g., Peter Pan)

M - group of people and/or their language (e.g., Indian)

N - proper name of real person, living or dead (e.g., Shakespeare)

O - organization (e.g., NATO)

P - period of time (e.g., Mesozoic)

R - religion (e.g., Buddhism)

S - man-made structure (e.g., Eiffel Tower)

T - title of musical composition, work of art, or literary work (e.g., Peer Gynt Suite, Mona Lisa, Peter Pan)

X - scientific classification (e.g., amoeba)

Series C Grade 6 Reviewer (name)

Technical Term	Punct	LX	TS	SA	S	C
TWELVE STONE ROW	HQ	T	S	MU	A	3
[illegible]	Q T	T		MU	A	3

NAME: _____

DATE: _____

APPENDIX I

RECORD LAYOUT FORM

COST CENTER: _____

EXTENSION: _____

TYPE OF RECORD Input of data for technical lexicon

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Technical Term	1	50	50	Single word or phrase*
2		51	51	1	Blank
3	Capitals & Punct.	52	55	4	Alpha, left justify
	Proper Nouns	56	56	1	Alpha
4		57	58	2	Blank
5	Lexicon	59	59	1	"T" (Technical)
6		60	61	2	Blank
7	Student or Teacher	62	62	1	Alpha, punch as written (S or T)
8		63	63	1	Blank
9	Subject Area	64	65	2	Alpha (first two letters of each SA)
10		66	68	3	Blank
11	Series	69	69	1	Alpha (series A,B, or C)
12		70	70	1	Blank
13	Grade Level	71	71	1	Numeric (grades 0...6)
14		72	72	1	Blank
15	Reviewer	73	73	1	Numeric (reviewer 1,2, or 3)
16		74	80	6	Blank

Comments:

Note: If any technical term exceeds 50 characters, punch 49 of them, and then punch an "" in column 50, disregarding remaining characters. On the original list sheet, draw a short red line under the beginning of this item and flag the page.

APPENDIX J

RECORD LAYOUT FORM

NAME: _____

DATE: _____

COST CENTER: _____

EXTENSION: _____

TYPE OF RECORD Output of data for technical lexicon

Field No.	Field Description	Columns From	Columns Thru	No. of Columns	Coding Instructions
1	Term	1	50	50	Single words or phrases
2		51	51	1	Blank
3	Punct	52	56	5	Left justify
4		57	57	1	Blank
5	LX	58	59	2	Right justify (all T)
6		60	60	1	Blank
7	ST	61	62	2	Right justify (S or T)
8		63	63	1	Blank
9	SA	64	65	2	Alpha (1st two letters of each SA)
10		66	66	1	Blank
11	S	67	67	1	Alpha (A, B, or C)
12		68	68	1	Blank
13	GL (R1)	69	75	7	
14		76	76	1	Blank
15	GL (R2)	77	83	7	Left justify (numeric, 0 through 6)
16		84	84	1	Blank
17	GL (R3)	85	91	7	
18	S-A	92	94	3	Center in 93, ave. cols. 69, 77, 85 (round .5 dow
19		95	95	1	Blank
20	T-A	96	98	3	Center in 97, total ave. of col. 93, series averages (round .5 down)

Comments:

For each term, there may be 1-3 lines of series information (A, B, or C), with from 1-3 reviewer fields (R1, R2, R3) on each line.

REFERENCES

American Heritage dictionary of the English language. New York: American Heritage Publishing Co., 1969.

Apel, W. *Harvard dictionary of music.* Cambridge, Massachusetts: Harvard University Press, 1962.

Blom, Eric, ed. *Grove's dictionary of music and musicians.* New York: St. Martin's Press Inc., 1968.

Carroll, J. B., Davies, P., and Richman, B. *The American Heritage word frequency book.* New York: American Heritage Publishing Co., 1971.

Cole, Luella. *The teacher's handbook of technical vocabulary.* Bloomington, Illinois: Public School Publishing Co., 1940.

Cronnell, B. and Rhode, M. A tryout of procedures for developing a technical lexicon. TN 2-72-17, SWRL Educational Research and Development, Los Alamitos, California, 1972.

Emery, Donald W. *Variant spellings in modern American dictionaries.* Urbana, Illinois: National Council of Teachers of English, 1973.

Encyclopaedia Britannica. Chicago, Illinois: Encyclopaedia Britannica, Inc., 1970.

Francis, W. N. *The structure of American English.* New York: The Ronald Press Co., 1958.

Harris, A. J. and Jacobson, M. D. *Basic elementary reading vocabularies.* New York: The Macmillan Co., 1972.

McGraw-Hill encyclopedia of science and technology. New York: McGraw-Hill Book Co., 1971.

Manelis, Leon. *The American Heritage word frequency book* and its relation to the communication skills lexicon. TN 2-72-38, SWRL Educational Research and Development, Los Alamitos, California, 1972.

Osborne, Harold, ed. *The Oxford companion to art.* Oxford: Oxford University Press, 1970.

Pressey, Luella C. *Vocabulary lists in fifteen school subjects.* Bloomington, Illinois: Public School Publishing Co., 1924.

Quirk, Randolph, Greenbaum, Sidney, Leech, Geoffrey, and Svartvik, Jan. *A grammar of contemporary English.* New York: Seminar Press, Inc., 1972.

Rhode, M. and Cronnell, B. Compilation of two components of the communication skills lexicon: the entry lexicon and the general lexicon. TN 2-74-11, SWRL Educational Research and Development, Los Alamitos, California, 1974.

Stauffer, Russell G. A vocabulary study comparing reading, arithmetic, health, and science texts. *Reading Teacher* 20 (November, 1966), p. 141.

Tsai, Alfred Y. Computer processing of technical lexicon data. TN 4-74-29, 1974, SWRL Educational Research and Development, Los Alamitos, California

Webster's seventh new collegiate dictionary. Springfield, Massachusetts: G & C Merriam Co., 1967.

Webster's third new international dictionary. Springfield, Massachusetts: G & C Merriam Co., 1961.